

**(57) Abstract:** The present invention provides to an improved hand truck having a tiltable platform for carrying heavy objects, which is safe to use and easily maneuverable, and requires the minimum amount of energy required for movement of heavy objects. The present invention provides a tiltable hand truck with minimal risk of injury and minimal risk of accidents for the operator while operating the present invention. The present invention provides a method for transporting a heavy load using a tiltable platform, which makes it easy for heavy objects to be transported with minimal effort.

## **TILTABLE HAND TRUCK**

### **RELATED APPLICATIONS**

This application claims priority from U.S. Patent Application Serial No. 10/386,090, filed March 10, 2003, entitled "Tiltable Hand Truck" which is incorporated herein by reference in its entirety.

### **BACKGROUND**

The present invention relates to a tiltable hand truck having a tiltable platform for the loading of heavy objects further having a steering assembly that allows for the movement of the heavy object in any direction. The present invention is particularly adaptable to lift any object that can be tipped or tilted to facilitate loading onto the tiltable platform.

A variety of hand trucks and dollies for movement of heavy objects are commercially available. Hand trucks and dollies can be used for a variety of purposes, such as transportation of heavy plant pots, movement of heavy boxes in warehouses, movement of heavy furniture and equipment, and generally facilitating the movement of heavy articles from one point to another. Many of these hand trucks and dollies are awkward to maneuver and exert much strain on the operator's joints, back, and muscles. Many of the commercially available hand trucks and dollies can cause severe injuries when improperly handled or improperly balanced. The present invention addresses these problems, and provides related benefits.

### **SUMMARY OF THE INVENTION**

The present invention relates to a tiltable hand truck that is safe to use and easily maneuverable, which requires the minimum amount of energy required for movement of heavy objects. The present invention provides a tiltable hand truck with minimal risk of injury and minimal risk of accidents for the operator while operating the present invention. This is because unlike existing dollies where the operator's body and strength acts to balance the weight of the object to be moved, the present invention required minimum energy to load an object and minimum effort and skill to maneuver.

One objective of the present invention is to provide an improved hand truck with a tiltable platform that is particularly adaptable to lift any object that can be tipped or tilted to facilitate loading onto the tiltable platform. The tilting of a heavy object that is to be moved requires much less energy than lifting the object. Tipping or tilting the object to be moved, exposes its underside, allowing the tiltable platform of the present invention to engage the object and act as a receiving dock for the tilted object. Moving the tiltable platform back to level position causes the weight of the object to balance at the pivot point and be loaded onto the tiltable platform with ease and without much effort by the operator. One advantage of the present invention is that the tiltable platform lifts into position the object to be moved in an upright position, which can then be transported and steered away to the location of choice.

Another objective of the present invention is to provide a hand truck with preferably a latchable tilting platform that can be tilted such that one end swings downwards to the ground and the opposite end swings upwards forming an incline. The end that swings downward can be positioned such that the topside of the tilting platform comes into contact with the bottom side of the tilted object to be moved. When the platform is tilted to level position, the object is automatically loaded onto the tilting platform by way of its own weight. The tiltable platform can then be locked into position by the latch in order to avoid further movement of the tiltable platform. Preferably, the present invention provides means for tilting the tiltable platform into loading position. The tilting can be achieved, for example, by attaching a raising bar to the stop shaft situated underneath the tiltable platform such that when the stop shaft is rotated by means of a handle, the raising bar rotates with the stop shaft and raises the tiltable platform. The tiltable platform is designed to tilt by pivoting means. The pivoting means is preferably attached to the midpoint of the tilting platform, but the pivoting means may be attached to the underside of the tilting platform in an off-centered configuration in certain embodiments of the present invention depending on the type and weight of the load to be moved.

Another objective of the present invention is to provide a hand truck with a plurality of wheels that allow for even distribution of the weight of the object to be moved and to facilitate the maneuvering of the loaded hand truck.

Yet another objective of the present invention is to provide for a tiltable hand truck with a steering assembly, which steering assembly is rotatably connected to the frame that houses the tiltable platform. This configuration facilitates precise locomotion and is highly maneuverable.

Another objective of the present invention is to provide a method for transporting an object from one place to another comprising the steps of providing a rigid frame having three sides an opening in front, providing means for locomotion such as wheel, tires, or other means capable of facilitating the locomotion of the device and load, preferably providing means for steering the device, and providing a pivoting carrying platform attached to said rigid frame. This method for transporting objects includes placing an object on the pivoting platform while the pivoting platform is in the loading position, that is the side of the pivoting platform near the open front is pivoted downwards to the ground, and the opposite side has pivoted upward forming an incline. In this position the object to be moved is tilted or tipped to one side so as to expose the underside of the object, and allow the pivoting platform access to the underside of the object. Once the underside of the object is contacted to the topside of the pivoting platform in the load position, the object to be moved is tilted back or untipped onto the carrying platform bringing the pivoting carrying platform to a level position, where a stop shaft halts further movement of the pivoting carrying platform and the loaded object.

Further objectives and advantages of the present invention will become apparent as the description proceeds and when taken in conjunction with the accompanying drawings. To gain a full appreciation of the scope of the present invention, it will be further recognized that various aspects of the present invention can be combined to make desirable embodiments of the invention.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

**FIG. 1** is a top/side prospective view of the tiltable hand truck with the carrying assembly and the steering assembly in detached configuration with the tiltable platform positioned for receiving an object to be moved.

**FIG. 2** is a top/side prospective view of the tiltable hand truck

**FIG. 3** is a top/side prospective view of the tiltable hand truck with the tiltable platform positioned for receiving an object to be moved showing a heavy object being loaded to be transferred to a new location.

**FIG. 4** is a top/side prospective view of the tiltable hand truck with the tiltable loaded with a heavy object to be transferred to a new location.

**FIG. 5** is a bottom side view of the tiltable hand truck showing the details of the underside of the tiltable hand truck with stop shaft and pivoting means.

#### **DETAILED DESCRIPTION OF THE INVENTION**

Referring to **FIG. 1-4**, the tiltable hand truck comprises a substantially U-shaped frame **100**, having a right side member **101** and a left side member **102** and a rear member **103**, a tiltable platform **104** is pivotally attached at one side to the right side member **101** and at the other side to the left side member **102** by way of a pivot **105**, which is fixedly attached at one side to the right side member **101** and at the other side to the left side member **102**. The tiltable platform **104** is fixedly attached to a hollow sleeve tube **106**, which acts as the sleeve for the pivot pin **105**, whereby the tiltable platform **104** can easily pivot about the pivot pin **105**. A stop shaft **107** is fixedly attached at one side to the right side member **101**, and at the other side to the left side member **102** near the rear member **103**. A plurality of wheels **108** are provided, preferably in pairs, each axially attached to the right side member **101** or the left side member **102**. A connecting member **109**, preferably attached fixedly to the rear member **103** at one end and releasably and rotatably connected to a steering assembly **110**, comprising steering wheels **111** axially attached to a steering shaft **112**, said steering shaft releasably and rotatably connected to the connecting member **109**, preferably by way of pin **113** and socket **114**. A handle **115**, preferably attached to the steering shaft **112**. The handle may preferably further comprise a multidirectional moveably joint **116** to facilitate steering and operation. The tiltable hand truck may preferably further comprise a latch **117**, preferably attached to said connecting member **109** wherein the tiltable platform **104** can be releasably latched in place in order to avoid further movement of the tiltable platform **104**.

The substantially U-shaped frame **100** can be manufactured from any rigid material, preferably metals such as aluminum, steel, stainless steel, etc. However, certain embodiments of the present invention may be manufactured from rigid plastics, rubber, woods, carbon composite material, or any variation thereof. The U-shaped frame **100** can be made by attaching three pieces of steel together to obtain the desired shape with a right side member **101** and a left side member **102** and a rear member **103**. In a preferred embodiment the U-shaped frame **100** is manufactured by bending a long piece of steel at its proximal ends in order to obtain the desired shape with a right side member **101** and a left side member **102** and a rear member **103**. The hollow sleeve tube **106** is preferably welded to the tiltable platform **104** nearly at the dividing line of the tiltable platform **104**. The pivot pin **105** is inserted into the hollow sleeve tube **106**, and is preferably welded at one end to the right side member **101** and at the other end to the left side member **102**. However, the pivot pin **105** can be attached to the side members **101** and **102** by other attaching means such as bolts. The stop shaft **107**, is preferably welded at one end to the right side member **101** and at the other end to the left side member **102** near the rear member **103**. However, other means of attachments such as bolts may be used. To facilitate smooth locomotion of the tiltable hand truck, especially when carrying a load, a plurality of wheels **108** are provide. The wheels **108** can be made of any type of material, but preferably, the wheels **108** are rubber wheels and are positioned in pairs, each axially attached to the side members **101** and **102**, and more preferably the wheels **108** are axially attached outwardly so as not to interfere with any object that is being moved. A connecting member **109**, preferably in a goose neck configuration, connects the substantially U-shaped frame **100** to the steering assembly **110**.

The steering assembly **110** can be manufactured from any rigid material, preferably metals such as aluminum, steel, stainless steel, etc. However, certain embodiments of the present invention may be manufactured from rigid plastics, rubber, or wood. At least one steering wheel **111**, and preferably two steering wheels **111** are provided, each axially attached to the steering shaft **112**. In the embodiment where only one steering wheel **111** is provided, the steering wheel **111** is axially attached to each proximal ends of the steering shaft **112** in an inverted U-format. In embodiments with more that one steering wheel **111**, each steering wheel **111**, is axially attached to each other at one side, and a proximal end of the steering shaft **112** at the other side

forming a stretched out inverted U-format. In a preferred embodiment the steering shaft is releasably and rotatably connected to the connecting member **109**, and said connecting member **109** is fixedly attached to said rear member **103**. However, other embodiments are considered, such as the steering shaft **112** being fixedly attached to the connecting member **109**, and the connecting member **109** being releasably and rotatably attached to the rear member **103**, or the steering shaft **112** being fixedly attached to the connecting member **109**, and the connecting member **109** being fixedly attached to the rear member **103**, or the steering shaft **112** being releasably and rotatably attached to the connecting member **109**, and the connecting member **109** being releasably and rotatably attached to the rear member **103**. A preferred means of releasably and rotatably attachment is by way of pin **113** and socket **114**, however other means are considered such as ball hitch and ball hitch receiver or a hook mechanism. In a preferred embodiment, a handle **115** is provided, said handle being fixedly attached to the steering shaft **112**. In the preferred embodiment the handle **115** further comprises a multidirectional movable joint **116** to facilitate steering and operation. In a preferred embodiment of the present invention a latch **117** is provided, said latch **117** being fixedly attached to the preferred goose neck shaped connecting member **109**. However, the latch **117** may also be fixedly attached to any of the side members **101**, **102**, or **103**. The latch **117** releasably locks the tiltable platform **104** in a level position after the object to be moved has been loaded onto the tiltable platform **104** in order to avoid further movement of the tiltable platform **104**.

Another embodiment of the present invention is to provide a method for transporting an object from one place to another comprising the steps of providing a rigid frame **100** having a right side member **101**, a left side member **102**, and a rear member **103** and open in front, providing means for locomotion **108**, **111** such as wheel, tires, or other means capable of facilitating the locomotion of the device and load, preferably providing means for steering the device **110**, and providing a pivoting carrying platform **104** attached to said rigid frame **100**. This method for transporting objects includes placing an object on the pivoting platform **104** while the pivoting platform is in the loading position, that is the side of the pivoting platform near the open front is pivoted downwards to the ground, and the opposite side has pivoted upward forming an incline. In this position the object to be moved is tilted or tipped to one side

so as to expose the underside of the object, and allow the pivoting platform **104** access to the underside of the object. Once the underside of the object is contacted to the topside of the pivoting platform **104** in the load position, the object to be moved is tilted back or untipped onto the carrying platform **104** bringing the pivoting carrying platform **104** to a level position, where a stop rod **107** halts further movement of the pivoting carrying platform **104** and the loaded object.

All headings are for the convenience of the reader and should not be used to limit the meaning of the text that follows the heading, unless so specified. Various changes and departures may be made to the present invention without departing from the spirit and scope thereof. Accordingly, it is not intended that the invention be limited to that specifically described in the specification or as illustrated in the drawings, but only as set forth in the claims.



What is claimed is:

1. A tiltable hand truck comprising:

a substantially U-shaped frame, having two side members fixedly joined with a rear member forming a rigid structure, wherein the space between said side members furthest from said rear member defines an open front;

a stop shaft fixedly attached to said two side members near said rear member;

at least one pair of wheels, each wheel axially attached to each of said two side members;

a tiltable platform pivotally attached at an intermediate point between said two side members, wherein said tiltable platform is capable of swinging downward to the ground at said open front, and wherein said stop shaft keeps said tiltable platform leveled and does not allow said tiltable platform to swing downward to the ground in the opposite direction;

a connecting member fixedly attached to said rear member;

a steering assembly comprising at least one wheel axially attached to a steering shaft, said steering shaft being fixedly attached to said connecting member;

2. The tiltable hand truck of claim 1, further comprising a handle connected to said steering assembly.

3. The tiltable hand truck of claim 1, further comprising a handle connected to said substantially U-shaped frame.

4. The tiltable hand truck of claim 2, wherein said handle further comprises a multidirectional movable joint.
5. The tiltable hand truck of claim 1, wherein said at least one pair of wheels are each axially attached to each of said side members near said open front.
6. The tiltable hand truck of claim 1, wherein two wheels are axially attached to said steering shaft.
7. The tiltable hand truck of claim 1, wherein said two side members are substantially parallel.
8. The tiltable hand truck of claim 1, wherein said connecting member is fixedly attached to said right side member.
9. The tiltable hand truck of claim 1, wherein said connecting member is fixedly attached to said left side member.
10. The tiltable hand truck of claim 1, wherein said steering shaft is releasably and rotatably connected to said connecting member.
11. The tiltable hand truck of claim 1, wherein said connecting member is releasably and rotatably connected to said rear member.
12. The tiltable hand truck of claim 1, wherein said connecting member is releasably and rotatably connected to both said rear member and said steering assembly.
13. The tiltable hand truck of claim 1, wherein said steering assembly and said shaft are connected by means of a pin and a socket.

14. The tiltable hand truck of claim 1, wherein said connecting member and said rear member are connected by means of a pin and a socket.

15. The tiltable hand truck of claim 1, where in said connecting member is connected to both said rear member and said steering assembly by means of a pin and a socket.

16. The tiltable hand truck of claim 1, wherein said each wheel of said pair of wheels is axially attached outwardly to each of said two side members near said open front;

17. The tiltable hand truck of claim 1, further comprising a latch attached to said rear member, wherein said tiltable platform is releasably latched to said rear member.

18. The tiltable hand truck of claim 1, further comprising a latch attached to said connecting member, wherein said tiltable platform is releasably latched to said connecting member.

19. A transport device comprising:

a means for carrying a load, tiltable attached to a means for support;

a means for halting the tilt of said carrying means attached to said support means;

a means for moving said support means attached to said support means;

a means for latching said carrying means attached to said support means;

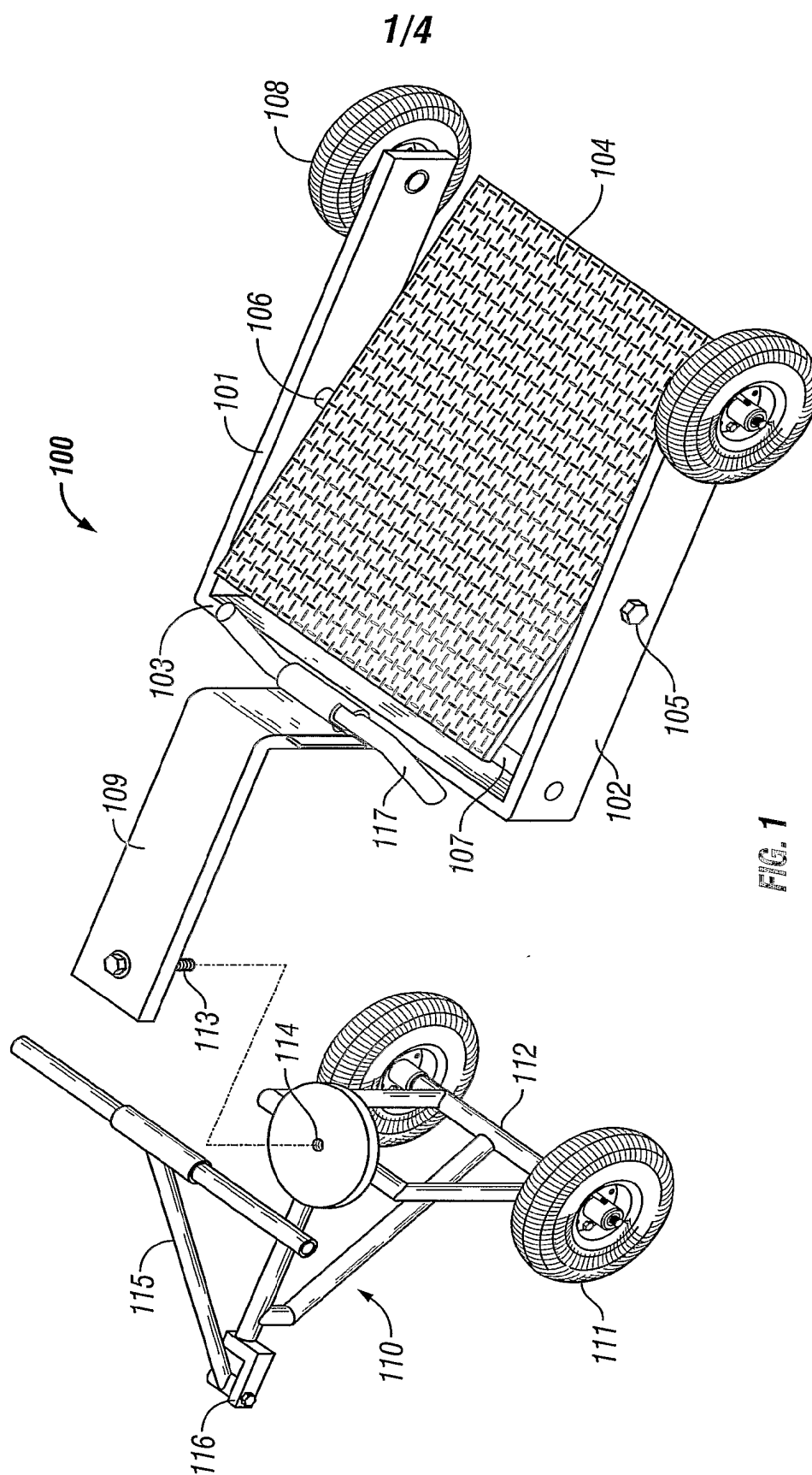
whereby said transport device can be moved in close proximity to said load, said carrying means tilted to the base of said load, said load tilted such that the carrying means can access the bottom side of said load, said carrying means tilted back into position, whereby said halting means impedes further motion and stabilizes said carrying means, said means

for latching applied to said carrying means to impede further tilting, said transport device with said load can be moved to a new location, said carrying means tilted to the ground and said load offloaded into a desired position.

20. A method of transporting a heavy load, comprising the steps of:

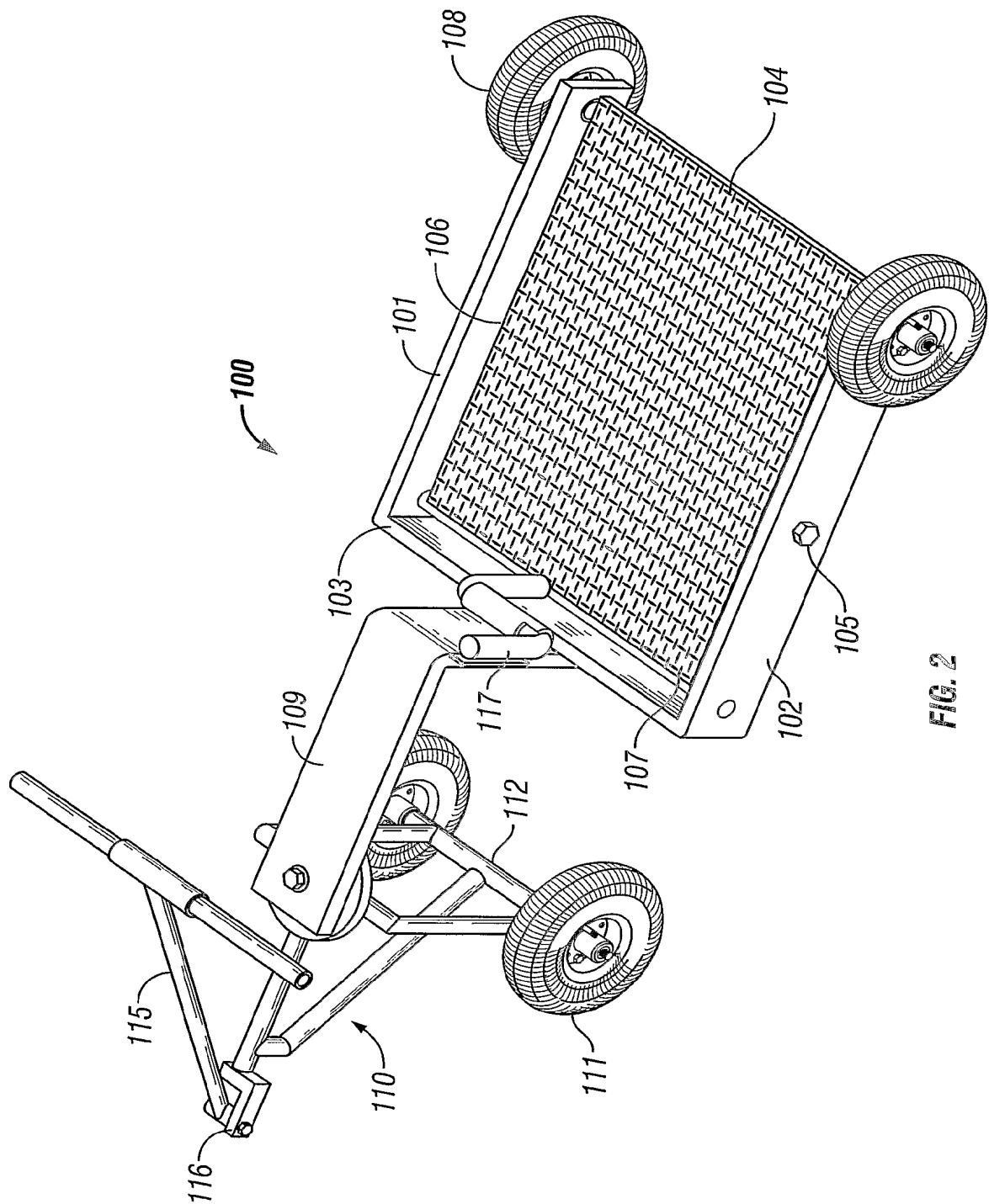
- a) providing a rigid frame comprising a right side member, a left side member, and a rear member forming a rigid structure;
- b) providing means for locomotion attached to said rigid frame;
- c) providing a pivoting carrying platform attached to said right and left side members;

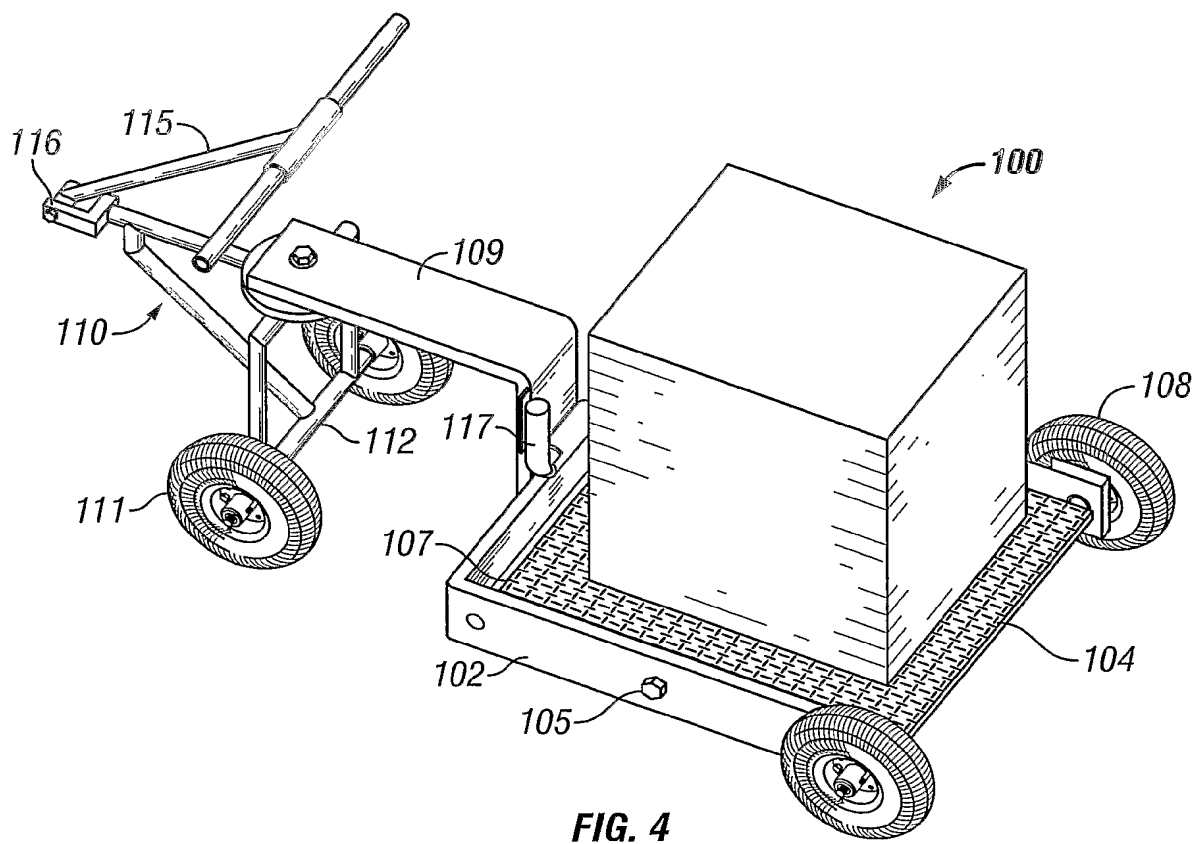
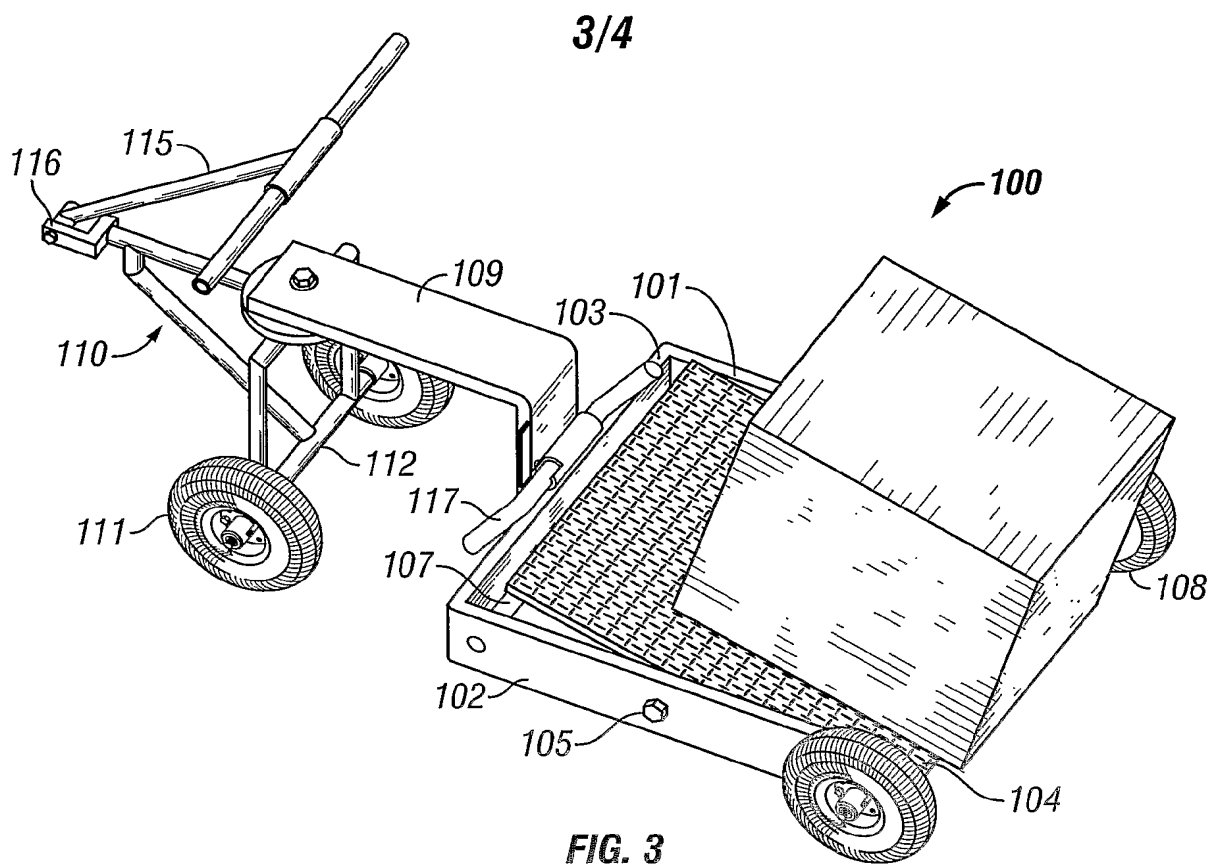
whereby a heavy load can be placed on said pivoting carrying platform, said heavy load being partially on the ground and partially on said pivoting carrying platform when said pivoting carrying platform is pivoted back to normal position placing said heavy load onto said pivoting carrying platform.



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**11**

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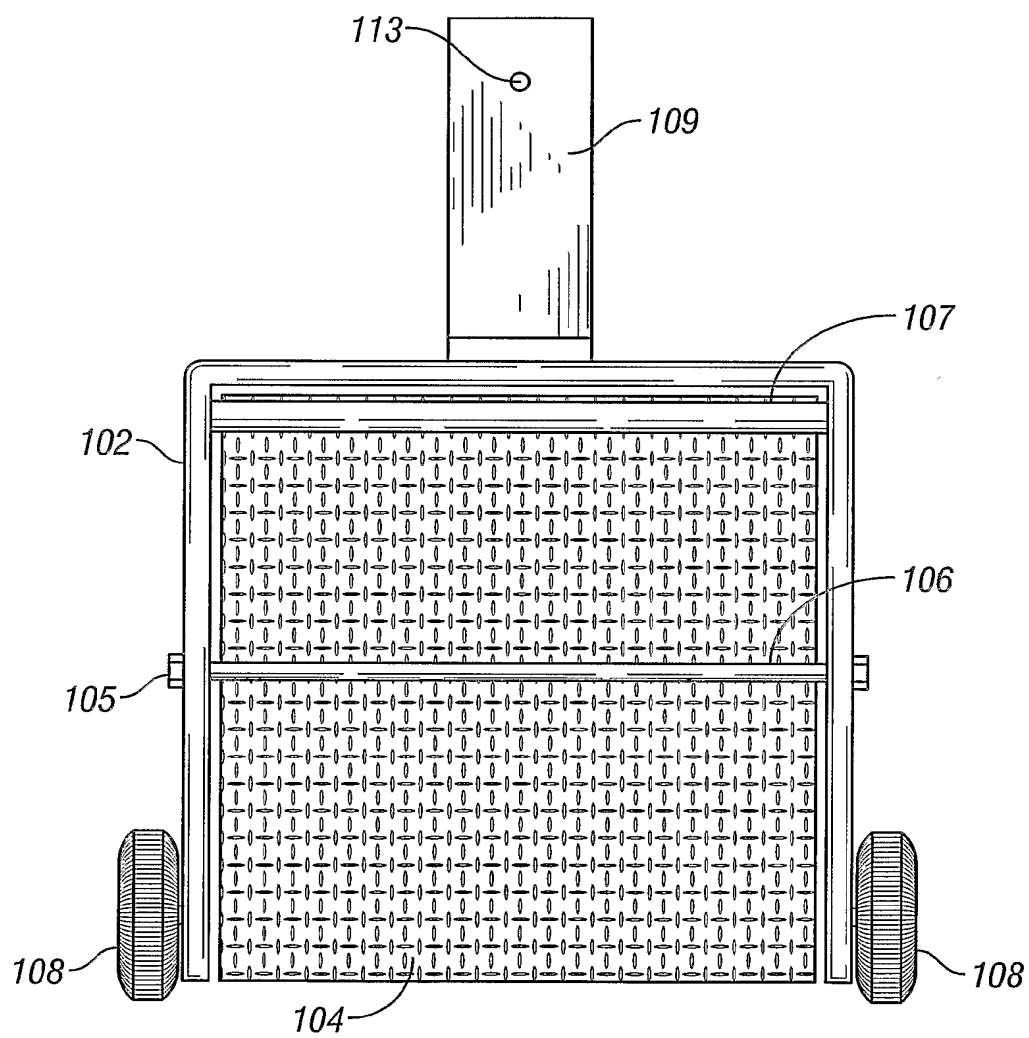


FIG. 5



# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/07025

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : B60P 1/04

US CL : 414/469

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 414/469; 280/30, 47.131

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,277,439 A (PIPES et al) 11 January 1994 (11.01.1994), see entire document.	20
A	US 4,155,471 A (YANCY) 22 May 1979 (22.05.1979).	
A	US 5,059,085 A (KOLLER) 22 October 1991 (22.10.1991).	
A	US 6,390,496 B1 (EICHER) 21 May 2002 (21.05.2002).	

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

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